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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/498,703	02/07/2000	Jahja I. Trisnadi	SLM-04300	9200

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EXAMINER	
RODRIGUEZ, ARMANDO	

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/498,703	TRISNADI, JAHJA I.	
	Examiner	Art Unit	
	Armando Rodriguez	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 19-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,59-63 and 1949* is/are allowed.

6)☒ Claim(s) *50-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/6/04,12/11/03,12*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claims 56-58 is withdrawn in view of applicant's arguments on page 11, where applicant has explicitly discussed how the rejected claim 50 recites the method steps of claim 56. After reviewing applicant's arguments the examiner agrees with applicant's reasoning, as the narrower apparatus means-plus function claim 50 including the broader method steps of claim 56 and since the examiner maintains the rejection of claim 50 the allowability of claims 56-58 is withdrawn.

Response to Arguments

Applicant's arguments filed February 27, 2004 have been fully considered but they are not persuasive.

Regarding applicant's arguments on page 10 pertaining to the recited reference of Suganuma not teaching the laser beam sources as not being incoherent with each other. Suganuma discloses the use of two laser sources (32a) and (32b) having different polarization as described in column 19 lines 1-7, where one laser has a horizontal polarization (p-polarization) and the other laser source has a vertical polarization (s-polarization), thereby the laser sources will have polarizations that are perpendicular to each other and will not interfere with each other, which implies and is understood by the examiner as being incoherent with each other.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 50-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suanuma (PN 6,249,381) in view of Florence (PN 5,313,479) and Tadic-Galeb et al (US 2001/0019454).

Regarding claims 50,55 and 56,

Suganuma illustrates in Fig. 11 an apparatus for combining polarized light from lasers (32a) and (32b) via polarized beam splitter (35), where lasers (32a) and (32b) are combined having output beams which are orthogonal polarized with each other and create a third beam. The laser beams have different paths via the beam splitter as one beam being transmitted and the other beam being reflected in accordance with their polarizaton, which would lead to one beam being incoherent with the other beam, as described in the abstract. Column 7 lines 64-67, discloses the use of a screen (17) for illuminating the output light, see figure 8.

Suganuma does not disclose the laser beam coupled to a depolarizing screen.

Florence teaches the use a diffuser (22) for eliminating the speckle caused by laser sources, as illustrated in figure 1 and described in column 2.

Tadic-Galeb et al illustrates in figure 1 a projection lens system having a display screen (36). In paragraph (78) it is disclosed that a similar screen, to screen (36) of

figure 1, is illustrated in figure 20 as screen (268), which may be a diffusive screen or a diffuser.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the laser system of Suganuma with a diffusive screen as shown by Tadic-Galeb because it would provide a speckle-free image displayed on the screen as taught by Florence that a diffuser will eliminate speckles.

Regarding claims 51,52 and 56,58,

The diffusive screen (268) of figure (20) provides transmission of the beam.

Furthermore, the above references disclose the claimed invention except for the arrangement of the diffusive screen being in a reflective mode. It would have been an obvious matter of design choice to arrange the diffusive screen in a reflective mode, since it appears that the invention would perform equally well in the transmission mode.

Regarding claims 54 and 55,

The above references disclose the claimed invention except for the combining means being a multilayer dielectric device or a birefringent crystal. It would have been an obvious matter of design choice to arrange a multiplayer dielectric device or a birefringent crystal instead of a beam splitter as disclosed by Suganuma, since it appears that the invention would perform equally with a multiplayer dielectric device or a birefringent crystal.

Allowable Subject Matter

Claims 1,19-49 and 59-63 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 1,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 1, where a polarizing beam splitter configured to divide a first polarized laser output into a second polarized laser output and third polarized laser output, the first polarized laser output having a coherence length; a light guide comprising a polarization preserving fiber optic, the light guide configured to create an optical path difference between the second polarized laser output and the third polarized laser output, the optical path difference being at least about the coherence length, the light guide being configured to direct the second polarized laser output to the polarizing beam splitter such that the polarizing beam splitter combines the second polarized laser output and the third polarized laser output into a fourth laser output and a depolarizing screen coupled to the fourth laser output, the fourth laser output illuminating the depolarizing screen.

Regarding claims 19-33,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 19, where a polarizing beam splitter configured to divide a first polarized laser output into a second polarized laser output and third polarized laser output; a plurality of mirrors configured to create an optical path difference between the second polarized laser output and the third polarized laser output, the plurality of mirrors

configured to direct the second polarized laser output to the polarizing beam splitter such that the polarizing beam splitter combines the second polarized laser output and the third polarized laser output into a fourth laser output; a piezoelectric transducer coupled to at least one of the mirrors, the piezoelectric transducer being driven by an electrical signal such that the optical path difference is varied by an amplitude, the amplitude being at least about a half wavelength of the polarized laser output, the electrical signal having an electrical signal frequency and a depolarizing screen coupled to the fourth laser output, the fourth laser output illuminating the depolarizing screen, the electrical signal frequency being at least a sufficient frequency such that laser speckle is reduced.

Regarding claims 34-40,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 34, having means for dividing a first polarized laser output into a second polarized laser output and third polarized laser output; the first polarized laser output having a coherence length; the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal; means for oscillating an optical path length of the second polarized laser output by an amplitude and with an oscillation frequency, the amplitude being at least about a half wavelength of the first polarized laser output; means for combining the second polarized laser output and the third polarized laser output into a fourth laser output and a depolarization screen coupled to the fourth laser output, the fourth laser output illuminating the

depolarizing screen, the oscillation frequency being at least a sufficient frequency such that laser speckle is reduced.

Regarding claims 41-43,

None of the cited prior arts alone or in combination discloses the claimed invention having the method steps for reducing laser speckle with the steps for dividing a first polarized laser output into a second polarized laser output and third polarized laser output, the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal, oscillating an optical path length of the second polarized laser output by an amplitude and with an oscillation frequency, the amplitude being at least about a half wavelength of the first polarized laser output, combining the second polarized laser output and the third polarized laser output into a fourth laser output and illuminating a depolarizing screen, the oscillation frequency being at least a sufficient frequency such that laser speckle is reduced.

Regarding claims 44-46,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 44, having means for dividing a first polarized laser output into a second polarized laser output and third polarized laser output; the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal; means for switching between the a first optical path length and a second optical path length for the second polarized laser output, a difference between the first optical path length and the second optical path length being about an odd multiple of a

half wavelength of the first polarized laser output; means for combining the second polarized laser output and the third polarized laser output into a fourth laser output, means for diverging the fourth laser output in a first direction to create a fifth laser output, a scanning mirror coupled to the fifth laser output, the scanning mirror reflecting the fifth laser output to create a line illumination, and a depolarizing screen illuminated by the line illumination, the scanning mirror repeatedly scanning the line illumination across a portion of the depolarizing screen such that the means for switching maintains the first optical path length for a first scan, switches to the second optical path length for a second scan, and alternates between the first optical path length and the second optical path length for subsequent scans.

Regarding claims 47-49,

None of the cited prior arts alone or in combination discloses the claimed invention having the method steps for reducing laser speckle with the steps for dividing a first polarized laser output into a second polarized laser output and third polarized laser output; the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal; switching between the a first optical path length and a second optical path length for the second polarized laser output, a difference between the first optical path length and the second optical path length being about an odd multiple of a half wavelength of the first polarized laser output; combining the second polarized laser output and the third polarized laser output into a fourth laser output; diverging the fourth laser output in a first direction; scanning the fourth laser output in a second direction across a portion of a depolarizing screen in

a first scan with the first optical path length, in a second scan with the second optical path length, and in subsequent scans alternating between the first optical path length and the second optical path length, the second direction being orthogonal to the first direction.

Regarding claims 59-61,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 59, having means for rotating a polarization of a laser output, whereby a rotating polarization is formed, the rotating polarization being driven with a rotation frequency and a depolarization screen coupled to the laser output, the rotation frequency being sufficient to reduce laser speckle.

Regarding claim 62,

None of the cited prior arts alone or in combination discloses the claimed invention having the method steps for rotating a polarization of a laser output, whereby a rotating polarization is formed, the rotating polarization being driven with a rotation frequency and illuminating a depolarization screen coupled to the laser output, the rotation frequency being sufficient to reduce laser speckle.

Regarding claim 63,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 63, having means for dividing a first polarized laser output into a second polarized laser output and third polarized laser output, the means for dividing

comprising a polarizing beam splitter, the first polarized laser output having a coherence length, the second polarized laser output and the third polarized laser output having orthogonal polarizations and having intensities that are about equal; a light guide comprising a polarization preserving fiber optic, the light guide coupled to the second polarized laser output, the light guide creating an optical path difference between the second polarized laser output and the third polarized laser output, the optical path difference being at least about the coherence length; means for combining the second polarized laser output and the third polarized laser output into a fourth laser output, the means for combining comprising the polarized beam splitter and a depolarizing screen coupled to the fourth laser output.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is 571-272-1952. The examiner can normally be reached on flex / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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